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DESCRIPTION OF A NEW ELLIPSOGRAPH.

BY THE EDITOR.

The figure at page 152, illustrating Mr. Adcock's solution of problem 432, suggests a method of constructing an ellipsograph which, so far as we know, is new, and which, on account of the facility with which it can be used and the simplicity of its construction, seems to possess some advantage over the various forms of the instrument we have examined.

The instrument here described consists of six parts:—

(1). A horizontal bar, with a vertical hole through its center and a groove along the middle of its under surface, in which a dovetail pin, in the loose end of a cursor, may slide freely from end to end.

(2). A vertical axis, having a milled head suitable for rotating with the thumb and fingers, and a wrist to fit the vertical hole in the horizontal bar; the axis must extend beyond the under surface of the bar and terminate in a square tenon, and between the tenon and the under surface of the bar one half the axis must be cut away so that the loose end of the cursor may pass the axis, and a groove must be cut in the axis extending upward from the under surface of the bar so that when the loose end of the cursor passes the axis the groove in the axis will be continuous with the groove in the bar; thus permitting the loose end of the cursor to pass the axis without interference.

(3). A radius, with a square mortise in one end in which the tenon at the extremity of the axis is to be inserted, and a round hole at the other end in which the wrist of a connecting pin may revolve.

(4). A cursor, with a square mortise in one end, in which a tenon at the upper end of the connecting pin is to be inserted, and a dovetail pin at the other end, made to slide smoothly along the groove in the bar.

(5). A connecting pin, with a wrist to fit the round hole in the end of the radius and a tenon at its upper end made to fit the mortise in the end of the cursor, and having a square head extending downward, below the radius, and perforated, parallel with the cursor, to permit a movable horizontal pen or pencil holder to slide back and forth parallel with the cursor.

(6). A pencil holder, constructed so as to slide back and forth through the perforation in the head of the connecting pin, parallel with the cursor.

Besides the six parts above described there should be a tension screw in the side of the bar, extending into a shallow groove cut around the axis, to retain the axis in position, and a clamp screw in the head of the connecting pin to clamp the pencil holder when the describing point is brought into the required position; and under each end of the bar (1) there should be fastened a block, or support, extending downward a little farther than the head of the connecting pin, so that the head of the connecting pin may move over the paper without friction.

The instrument may be made of any desired dimensions, provided only that the length of the radius, from the center of the axis to the center of the connecting pin must be equal to the length of the cursor from the center of the connecting pin to the center of the dovetail pin, and the bar (1) must be not less than double the sum of the lengths of the radius and cursor.

The major axes of ellipses, described by the same instrument, may be vararied by making several sets of holes for the connecting pin through the radius and cursor, and the minor axis is varied by moving the pencil holder in the head of the connecting pin.

To draw a given ellipse; insert the connecting pin through corresponding holes in the radius and cursor so that the length of each shall be equal to one fourth the sum of the axes of the given ellipse; place, and clamp, the pencil holder so that the distance of the describing point from the center of the connecting pin shall equal one fourth the difference of the given axes; place the bar upon the paper so that the groove is over the desired position of the major axis and hold it in position with one hand, then, with the other hand, turn theaxis through one complete revolut'n and the describing point will trace out the given ellipse.